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S58-210289 [1983]**(54) Window opening-and-closing device**

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SPECIFICATION**1. Title of the Invention**

Window opening-and-closing device

2. Claims

A window opening-and-closing device that is characterized in that it is made in such a way that it has a support fitting that is fastened to a metal border and a receptacle fitting that is fastened to the window frame, the two fittings are coupled by passing through guide holes in guide parts a shaft that passes through an insert-through part provided on the support fitting, receptacle parts provided on the receptacle fitting are made to face support pieces provided on the support fitting and the support pieces are caught by the receptacle parts in the state in which the metal border closes the window frame, and in the state in which the metal border opens up from the window frame, the guide holes guide the shaft and rotate and support the metal border.

3. Detailed Description of the Invention

This invention concerns a window opening-and-closing device that is made in such a way that opening and closing is done by putting a metal border in a perpendicular state with respect to the window frame by putting it down on either the interior or exterior side.

Many types of so-called "rotating windows" are known, in which the left or right side or the upper edge or lower edge of a metal border is supported rotatably, and opening and closing is done by rotating said metal border to the exterior or interior side. With regard to the composition of a rotating window, in many of them the window frame and the metal

border are coupled by an arm, and as one that makes use of the metal border itself, the one disclosed in utility model S51-26905 [1976] is known.

But the opening-and-closing device of a window of this composition requires that a guide fitting for the metal border be provided within the side frame of the window frame.

This makes the on-site installation work very troublesome, and in particular the metal border cannot be opened and closed without accurate positioning of the guide fitting and of the hinge that protrudes from the metal border.

This invention, which is proposed in view of what has been described above, offers a window opening-and-closing device in which the operation of opening and closing can be done easily using the weight of the metal border itself, and which can be very simply attached to the window frame.

In the following, we describe this invention by means of the working example depicted in the drawings.

In the case of a high-rise building, window frame 1 consists of long vertical frames (jambs) 2 and crosspieces (transoms) 3, with metal border 4 fitted-in between the left and right vertical frames 2, 2 and the top and bottom crosspieces 3, 3.

The opening-and-closing device of this invention consists of support fitting 5, which is fastened to metal border 4, and receptacle fitting 6, which is fastened to crosspiece 3 of window frame 1; preferably, support fitting 5 is fastened to lower frame 4' of metal border 4, and receptacle fitting 6 is fastened to the crosspiece 3 that is positioned on the lower side of metal border 4.

In said support fitting 5, which preferably is formed from aluminum or another metal, horizontal cylindrical shaft insert-through part 11 is provided on the end of fold-back part 9 of attachment part 10, on which vertical part 8 is provided facing downward on one edge of long horizontal part 7, and fold-back part 9 is provided roughly parallel to vertical part 7 on the lower end of said vertical part 8, and obliquely downward-facing support piece 12 is extended to the base end of fold-back part 9 and insert-through part 11.

And in said receptacle fitting 6, guide parts 14 protrude obliquely upward on one edge of horizontally long attachment base plate 13 separated from each other by the length of said insert-through part 11, and receptacle part 15 is provided on an edge of attachment base plate 13 so as to be positioned at the base end of said guide parts 14. It has on each guide part 14 an arc-shaped guide hole 16 centered on receptacle part 15, and receptacle part 15 is made in a groove shape with two protruding strips 17, 17 provided lengthwise on the surface of attachment base plate 13.

Said support fitting 5 and receptacle fitting 6 form a hinge structure with both ends of shaft 18, which goes through insert-through part 11, passing through guide holes 16, 16 in left and right guide part 14, 14.

It is preferable that two thus constructed opening-and-closing devices be attached to each metal border 4 as shown in Figure 1, and that in attaching them, horizontal part 7 of support fitting 5 be put against the lower surface of lower frame 4' of metal border 4, and that the screws that go through small holes 7' in said horizontal part 7 be screwed to lower frame 4'. Done in this way, receptacle fitting 6 will hang from the lower surface of metal border 4, causing lower frame 4' to be opposite crosspiece 3 with metal border 4 in window-open state as shown by the dotted line in Figure 3. Then attachment base plate 13 of receptacle fitting 6 will be against the upper surface of crosspiece 3, and the screws that pass through small holes 13' in said attachment base plate 13 will be screwed to crosspiece 3.

If an opening-and-closing device that consists of a receptacle fitting and a support fitting is interposed between the metal border and the window frame in this way, said opening-and-closing device will have a hinge function in opening and closing the window. That is, in the window-closed state in which metal border 4 is roughly perpendicular and window frame 1 is sealed, support piece 12 will catch on receptacle piece 15 as shown in Figure 2; and the end side of shaft 18 will be positioned above guide hole 16. Therefore almost all the load of metal border 4 is borne by support piece 12. Beginning with such a window-closed state, if rotated so as to make metal border 4 more horizontal, then as shown

by the solid lines in Figure 3, support fitting 5 will rotate about the lower end of support piece 12 as a fulcrum, and at the same time shaft 18 will rotate downward along guide holes 16. And when further rotated from the state in which shaft 18 has reached the lower end of guide hole 16, so as to make metal frame 4 even more horizontal, then as shown by the dotted line in Figure 3, support fitting 5 rotates about shaft 18 as a fulcrum, support piece 12 lifts upward out of receptacle part 15, and a window-open state results. Therefore the load of metal border 4 is transferred from support piece 12 to shaft 18, and the rotation of metal border 4 becomes smooth.

Also, if, from a window-open state in which metal border 4 is in a horizontal position, it is rotated to bring it back into a vertical state, then support fitting 5, after rotating in reverse about shaft 18 as a fulcrum, if the tip of support piece 12 is brought to lie against receptacle part 15, then it rotates about said receptacle part 15 as a fulcrum, and shaft 18 shifts upward along guide holes 16.

Therefore in this case too, the load of the metal border shifts rapidly, making the rotation smooth.

Thus with this invention, not only does the opening-and-closing operation of the metal border become very simple, but in particular the support fitting and receptacle fitting can be fastened securely to the metal border and window frame while their shaft-coupled hinge structure remains. Thus there is no need for any assembly operation at the construction site, and if the support fittings are fastened to the metal border beforehand, such as at the factory, then it suffices simply to attach the receptacle fittings to the window frame as-is, with no need for adjusting the attachment position.

And because the support fittings and receptacle fittings are positioned between the metal border and the window frame and are not exposed on the surface, they do no detract from the attractive appearance of the building.

In the above working example we have presented the case in which the guide parts of the receptacle fittings are provided on the left and right, but multiple such parts may be provided as well, such as having three or more at suitable intervals and providing the insert-through parts of the support fittings with suitable spacing between adjacent guide parts. And the composition of both the support fittings and the receptacle fittings may be modified, as long as they do not change the gist of what is set forth in the claims.

4. Brief explanation of the drawings

The drawings depict a working example of this invention; Figure 1 is a schematic front view installed in a window frame, Figure 2 is a partial side view of the window-closed state, Figure 3 is a side

view of the same in window-open state, and Figure 4 is an exploded perspective view.

5 ... support fitting, 6 ... receptacle fitting, 11 ... insert-through part, 12 ... support piece, 14 ... guide part, 15 ... receptacle part, 16 ... guide hole, 18 ... shaft.

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Figure 1

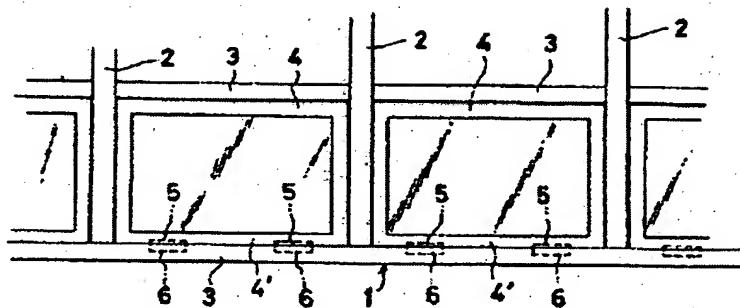


Figure 2

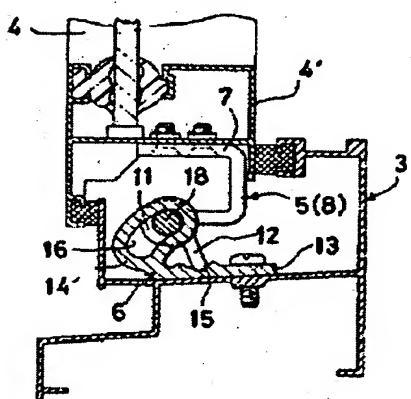


Figure 3

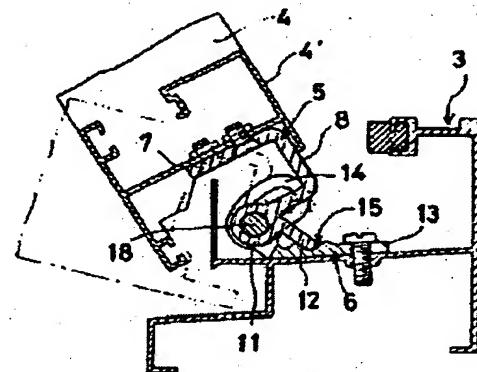
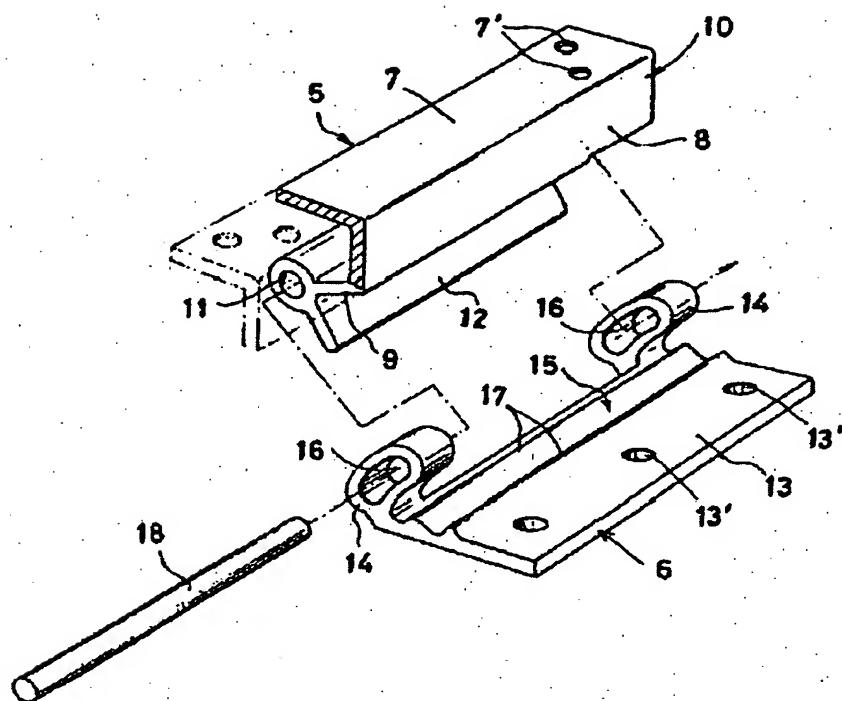


Figure 4



⑨ 日本国特許庁 (JP)
⑩ 公開特許公報 (A)

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④窓の開閉装置

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明細書

1. 発明の名称

窓の開閉装置

2. 特許請求の範囲

金属障子に固定する支持金具と窓枠に固定する受金具とを有し、支持金具に設けた押通部に通す軸を受金具に設けた案内部の案内孔に通して両金具を連結し、支持金具に設けた支持片を受金具に設けた受部に嵌ませて金属障子が窓枠を閉じている状態で受部で支持片を受け止め、金属障子が窓枠から開く状態では案内孔が軸をガイドして金属障子を回動支持するようにしたことを特徴とする窓の開閉装置。

3. 発明の詳細な説明

この発明は窓枠に対して金属障子を室内側に又は室外側に倒したり直立状にして開閉するようとした窓の開閉装置に関するものである。

金属障子の左右一側又は上端、下端を回動可能に支持し、該金属障子を室外側又は室内側に回

動して開閉する所謂回転窓は多種知られている。回転窓の構成としては窓枠と金属障子とをアームで連結したものが多いたが、金属障子の自重を利用して連結したものとして実公昭51-24905号公報に示すものが知られている。

しかしこの構成の窓の開閉装置は窓枠の側面内筋に金属障子の案内金具を設けなければならぬ。

したがつて現場での取付作業が極めて面倒で、特に案内金具と、金属障子から突出するヒンジとの位置関係を正確にしないと金属障子を開閉できない。

本発明は上記に鑑み提案されたもので、金属障子の自重を利用して駐車に開閉操作することができ、しかも窓枠への取付けが極めて簡単な窓の開閉装置を提供する。

以下に本発明を図示の実施例により説明する。
高層建築物の場合、窓枠1は長尺な縦枠(方立)2と横材(横目)3と共に構成され、左右の縦枠2、2と上下の横材3、3との間に金属障子4

子¹を嵌め付けてある。

本発明の開閉装置は金属障子⁴に固定する支持金具³と窓枠¹の横材²に固定する受金具⁶とからなり、最もしくは支持金具³を金属障子⁴の下端^{4a}に固定し、受金具⁶を金属障子⁴の下端に位置する横材²に固定する。

上記支持金具³は、横長な水平部分^{3a}の一側面に垂直部分^{3b}を下向きに設け、該垂直部分^{3b}の下端に水平部分^{3a}と平行な折返部分^{3c}を設けてなる取付部¹⁰の折返部分^{3c}先端に横筋状の軸用押通部¹¹を設けるとともに、折返部分^{3c}と押通部¹¹との基端に斜下向きの支持片¹²を嵌設したもので、アルミニウム、その他の金属より形成するのが望ましい。

又、上記受金具⁶は横長な取付基板^{6a}の一側面に前記押通部¹¹の長さだけ離して斜上方に露出する案内部¹⁴を設けるとともに、取付基板^{6a}の側縁には上記案内部¹⁴の基端に位置するよう受部¹⁵を設けたものである。各案内部¹⁴には受部¹⁵を中心とする弧状の案内孔¹⁶を有し、また

閉装置は操作機能を有して窓を開閉する。即ち、金属障子⁴がほど直立状となつて窓枠¹を閉止した閉窓状態では第2図で示すように支持片¹²が受部¹⁵に受け止められ、軸¹⁸の頭部側が案内孔¹⁶の上端に位置している。したがつて金属障子⁴の街端はほどんど支持片¹²で受け止めている。このような閉窓状態から金属障子⁴を倒すように回動すると、第3回実験で示すように支持金具³は支持片¹²の下端を支点に回動し、同時に軸¹⁸が案内孔¹⁶に沿い下方に回動する。そして軸¹⁸が案内孔¹⁶の下端にまで達した状態から更に金属障子⁴を倒すように回動すると、第3回実験で示すように支持金具³は軸¹⁸を支点に回動し、支持片¹²が受部¹⁵から上方に外れて開窓状態となる。したがつて金属障子⁴の街端は支持片¹²から軸¹⁸に移動し、金属障子⁴の回動が円滑となる。

なお金属障子⁴が何れか開窓状態から直立状態に戻し回動すると、支持金具³は上記とは逆に軸¹⁸を支点に回動した後、支持片¹²の先端が受

部¹⁵に嵌設すると該受部¹⁵を支点に回動し、軸¹⁸が案内孔¹⁶に沿い上方に移動する。

したがつてこの場合においても金属障子⁴の荷重が選かに移動するので回動が円滑である。

このように本発明によれば金属障子の開閉作動が極めて簡単となるばかりでなく、特に支持金具と受金具とを軸で連結した総合構造のまゝ金属障子と窓枠との間に固定することができる。したがつて建築規制で何も耐立てる必要がなく、支持金具をあらかじめ工場などで金属障子に固定すれば受金具をそのまゝ窓枠に取付けるだけでよく、取付位置を調節する手間がない。

また支持金具及び受金具は金属障子と横材との間に位置して表面に露出しないので、建築物の美観を損なうことがない。

上記した実験例では受金具の案内部を左右に設けた場合を示したが、適宜向側で3個以上設けるとともに支持金具の押通部を取り合う案内部間隔に斜まるように複数設けてよい。また支持金具、受金具とも特許請求の範囲に記載した

操作をえない限りどのような構成にでも変更
することができる。

各図面の簡単な説明

図面は本発明の実施例を示すもので第1図は
底板に取付けた紙路正面図、第2図は開盤状態
の一部を欠裁した側面図、第3図は開盤状態の
側面上の側面図、第4図は分解側面図である。

3…支持金具、6…受金具、11…押送部、12…
支持片、14…案内部、15…受部、16…案内孔、
18…軸

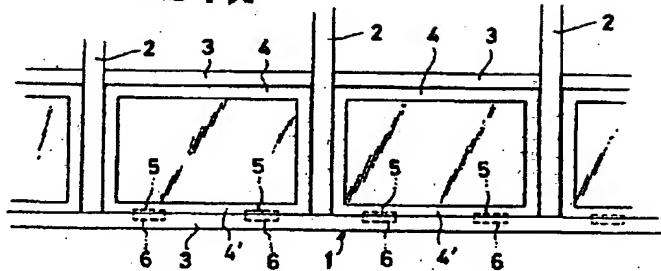
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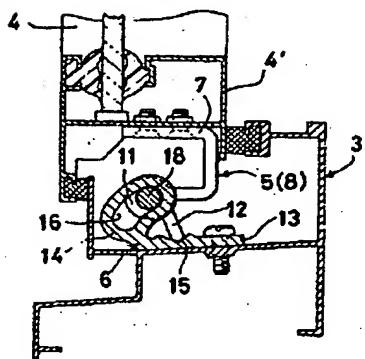
同 代理人弁理士 福田 武道

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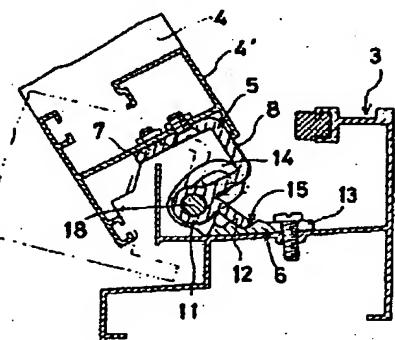
第1図



第2図



第3図



第4図

